

# Investigate the impact of media on public understanding of health and medical science in China

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**Abstract.** In the rapidly developing digital age, media has become an influential aspect of human existence, particularly in shaping perceptions of health and medical science. This is evident in China's experience during COVID-19, highlighting the media's power in health science communication. Media bridges the gap between scientists and the public, yet also holds the potential for misinformation and pseudoscience. This study explores the impact of media on health science understanding in China, using existing literature to assess its advantages and disadvantages. This study reveals that media effectively enhances public health knowledge through rapid dissemination speed, broad audience reach, and systematic public surveillance. However, its drawbacks are noteworthy. Media's rapid spread can accelerate the spread of misinformation and rumours, causing panic and psychological distress among the public and harming individuals' privacy and personal rights. This study underscores the media's dual role in influencing health science understanding in China, emphasising that future research is worth exploring whether this shift will lead to increased pressures on public management and social cohesion.

## 1. Introduction

With the rapid development of the digital age, media has become an essential and profoundly influencing aspect of human existence. Media refers to various communication channels that convey knowledge, news, and entertainment to a large audience. It comes in various forms, such as television, newspapers, social media, and online videos. According to McLuhan, the key concept of "the medium is the message" argues that the medium through which information is transmitted is more significant than the content itself [1]. McLuhan believed that media, in all its forms, significantly influenced society and individuals, ultimately shaping their perceptions, behaviours, and interactions [1], making information more accessible, interesting and clearly delivered to the public. This vital feature of the media plays a significant role in science communication, especially in the public perception of health and medical science [2]. This became especially prominent during the COVID-19 pandemic. Research has shown that media can be used to spread health information, such as health interventions, health campaigns, medical education, and disease outbreak surveillance [3]. Media's involvement in science communication is essential in bridging the gap between scientists and the general public. However, because many platforms are centred on a participatory culture where passive consumers can become active participants, this has altered the role of science journalists as gatekeepers [4]. Along with

scientists, non-scientific actors play experts' roles and participate in the dialogue between science and the general audience [4]. Therefore, it can be seen that the media may also negatively affect the dissemination of scientific information, such as misinformation and the spread of pseudoscience.

China has especially experienced the power of the media to transmit health science information during COVID-19. The Chinese government implemented several strategies to control the pandemic, such as case isolation, contact tracing, environmental disinfection, and self-prevention [5]. The self-prevention is the most advocated by the Chinese government. The Chinese Centre for Disease Control and Prevention (China CDC) published prevention recommendations that included wearing face masks, frequently washing hands with soap and water, covering coughs and sneezes with tissues, maintaining social distancing, and more [6]. During this crisis, media effectively influences human health behaviours as it satisfies the high demand for information from the public. However, the credibility of scientific information disseminated by the media to the public remains to be further investigated. Therefore, according to the current Chinese media and people's awareness of science and health, this study will utilise existing literature as a foundation to investigate the influence of media on the understanding of health and medical science in China while also evaluating the advantages and disadvantages it can bring to the country.

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## 2. The present situation in China

In recent years, China has undergone a remarkable transformation in its media consumption patterns and national health awareness, reflecting the impacts on the nation, especially on the country's rapid modernisation and digital revolution. China has become one of the world's largest media consumers, witnessing an unprecedented surge in internet usage, social media engagement, and smartphone adoption. This exponential growth in digital connectivity has revolutionised how Chinese citizens access information and has also played a significant role in shaping their awareness and attitudes towards public health.

### 2.1 Chinese media consumption patterns

However, first, it is necessary to understand the current media consumption patterns in China. Thomala, a specialist in China's internet and media advertising industries, notes that China's media sector was only open to private investment from the late 1980s, a period of considerable economic liberalisation [7]. Since then, the market has continued to rise with significant momentum. Like some developed nations, traditional media in China is on the decline while social media is expanding [7]. For example, newspaper publishing as the traditional media in China steadily declined over the past few years [7]. The average newspaper reaches in China decreased from 52% in 2010 to under 20% in 2020 [7]. However, due to increased smartphone usage, numerous print media enterprises have transitioned to social media platforms like WeChat, Weibo, and Douyin (the Chinese equivalent of TikTok) [7]. This phenomenon is the proven decline of traditional media and the transformation to new media in China. There are, however, certain exceptions, such as the power of broadcast, where television in China continues to maintain its dominance with the highest penetration rate among conventional media [7]. Even though online advertising revenue has rapidly increased, it is still difficult to replace television in advertising and marketing, particularly in promoting food and beverage brands [7]. Beyond that, however, China continues to be a nation that extensively relies on the Internet. By 2022, the average daily time consuming and interacting with media by internet users in China is 325 times in minutes, followed by watching television online 173 times in minutes and using social media 119 times in minutes [8]. In relation to social media, influencer marketing has emerged as the latest marketing trend and has successfully influenced consumer behaviour. Therefore, it can be seen that the current Chinese media has a rapid communication speed, a large audience base, and a straightforward way to influence the public, such as national health awareness.

### 2.2 Chinese health awareness

Promoting national health awareness has always been one of China's development priorities, and the media significantly affects it. However, the research indicates that the current level of public health awareness still has

many development opportunities. The Healthy China 2030 plan, which was launched by the Central Committee of the Communist Party of China and the State Council in October 2016, aims to improve people's health by 2030 by promoting healthy lifestyles, optimising health services, enhancing health security, creating a healthy environment, and fostering the growth of the health industries [9]. The "initiative practice for health" (IPFH) concept derives from Healthy China 2030, a procedure where individuals take the initiative to learn about health-related topics, improve their way of life, and guarantee their health condition [10]. Zhang et al. investigated the Chinese public awareness of IPFH and the Healthy China 2030 plan by conducting self-designed questionnaires [10]. The findings demonstrate that while the majority of community members are often concerned about their health, the Chinese population is largely unaware of IPFH [10]. Strong IPFH awareness is associated with older age, higher income, and professional experience in the medical field [10]. More attention should be paid to young people, particularly those from low-income, rural, and educationally underprivileged areas. [10]. This is just one study that analyses the national health policy in China. In China, there are numerous associated initiatives, such as One Health. Wu et al. show that many people are aware of the One Health policy but have not taken action [11]. As a result, it is clear that the Chinese population's health awareness needs to be improved, but the media will be crucial in achieving this.

The following section will be conducted based on existing literature to analyse the influence of media on national health awareness from three perspectives, "media and publication," "media communication and audience," and "media and surveillance," since research suggests that there is some correlation between mainstream media channels and national health awareness in China.

## 3. Media and publication

Media publications are the first possible influence shaping public comprehension of health and medical science information. Media publication comprises two key aspects: the publishers responsible for producing and distributing content and the nature of the content that is made available to the audience that shares the information. Both of these ideas for media publication have their own ways of affecting how the media conveys information about health and medical science to the audience.

### 3.1 Publisher

From the perspective of the publisher, it is evident that various publishers have diverse degrees of influence over the audience regarding health and medical science information. In the era of social media and the Internet, the democratisation of information dissemination has enabled virtually anyone to become a media publisher and can post any information on any topic they want, facilitating the rapid spread of health and medical science awareness [2]. However, this also makes people become self-appointed experts who will distribute misleading

information, whether intentionally or unintentionally and may also have different points of view based on cultural and geographical variables. Leng et al. researched the misinformation during the COVID-19 outbreak in China, where they classified misinformation into different aspects; the prevention strategies, disinfection and treatment remained the most popular misinformation topic that the public discussed [12]. For instance, people shared and published their experiences with these topics in the media, with traditional Chinese medicine (TCM) being one of the most widely discussed concepts in terms of treatment for COVID-19. It has been practised for thousands of years to treat various diseases, and millions in China use it [13]. It includes a variety of therapies such as herbal medicines, massages, acupuncture, and diets [13]. For example, a local government in southwest China shared a frequently used TCM on social media to avoid COVID-19 infection, and they suggested brewing tea with orange peels and monk fruit [14]. More similar cases appeared during that time, such as the blog titled "The native COVID-19 prevention and treatment, effective!" that another internet user published, which mentioned treatments such as drinking salt water and eating more garlic that can make you immune to infections [15]. All these methods have since been critically argued to be pseudoscientific and ineffective in treating illnesses. However, although there is little peer-reviewed data to back up these treatments because anyone can publish them, information is widely spread among the public, leading many people to believe the rumours and mistakenly think that they are true. This shows the significant influence of media publishers because anyone can share, resulting in serious issues of spreading false information, and it is a great challenge for public cognition since they will struggle to distinguish the truth.

In addition to the fact that everyone can express themselves in the media, plenty of authoritative media reports act as opinion leaders that are utilised to shape how people perceive health and medical science. The idea of an opinion leader is derived from the Two-Step Flow of Communication theory proposed by Katz and Lazarsfeld in the 1940s. He claims that communication does not go directly from mass media to individuals but is instead filtered and interpreted by opinion leaders before being disseminated to the public [16]. Fang, Gao and Li analysed the impact of microblogging (Weibo) opinion leaders during the COVID-19 pandemic [17]. It classified two types of opinion leaders found on microblogging. One is what they called the "VIP celebrities", which could be entertainment stars, tourism or education microbloggers, and other possible identities [17]. They often express positive opinions to the public to avoid negative attitudes. Another type is Government-related microblogs opinion leaders, which are created for public relations on behalf of government officials and agencies [17]. They play a critical role in the official dissemination of epidemic information, the publication of prevention and control strategies, and the avoidance of rumours [17]. With these opinion leaders in microblogging, they successfully guide netizens by releasing positive information and consistently reinforcing current opinions

under the influence of social groups with consensus [17]. However, this aspect of media representation also carries a disadvantage. It leverages the identity of authority to direct the public's perception and belief towards a single perspective, as designed by those in power [17]. This circumstance is frequently observed during the COVID-19 era and often constitutes a strategy employed by governmental bodies. As such, it remains a possibility that opinion leaders or authoritative publishers themselves may demonstrate partiality.

### 3.2 Content published

Regarding the content within the media published, it exerts both favourable and adverse influences on the public's interpretation of health and medical science. Kanchan and Gaidhane sum up some key advantages that the content media published influence on the public. First, studies have shown that engaging social media content can increase the levels of health promotion, particularly for women. For example, menstrual hygiene, breast cancer awareness, the significant use of antibiotics, sexual health promotion, and many other topics can all be improved through social media [2]. Second, it also permits changes in behaviour and health [2]. Using the unique platform of social media, Bonar et al. used it to target young people who engaged in risky drinking [18]. Later that year, he also created another effective questioning and behavioural intervention targeting cannabis use among emerging adults [18]. Both interventions proved successful in changing unhealthy behaviours. However, drawbacks certainly cannot be avoided from the published content of the media, just as the issues with the publishers, inaccurate research content can also lead to the spread of misinformation. In addition, to make the content eye-catching, the content might be fear-inducing, creating unnecessary panic and anxiety among the public [2]. Overemphasis on rare health events or framing medical issues alarmingly can contribute to heightened stress and irrational reactions [2]. Besides, to make difficult medical matters easier to understand for a wider audience, most media coverage frequently oversimplifies them. However, this simplification could result in losing important nuances and a superficial comprehension of complex medical problems [19]. Hence, the content disseminated through media platforms wields a dual-edged impact on public health and medical science awareness, encompassing both beneficial and detrimental effects.

## 4. Media communication and audience

Media communication and target audience constitute the secondary factors influencing the public's understanding of health and medical science information. The emergence of new media has given the media two novel attributes: enhanced communication speed and improved audience acceptance. These dual characteristics wield a varied range of impacts on the general public.

### 4.1 Communication speed

The rapid transmission speed stands as a distinctive trait of new media. It allows for faster, broader and more effective dissemination of information. Especially during the pandemic, new media played a pivotal role in quickly spreading crucial information. This includes sharing diagnostic, treatment, and follow-up protocols, as well as adapting diverse global approaches to our local context and available resources [20]. Similar to the cases mentioned earlier, governmental organisations uphold official accounts on prominent social media platforms such as Weibo, TikTok, and others. Therefore, when a major health crisis or emergency arises, these agencies can promptly issue announcements through their official accounts, soon notifying all users of the respective software within moments. However, despite its rapid transmission speed, it still cannot avoid potential drawbacks such as spreading false data, misconceptions, and negative information. When compounded by quarantine periods, these factors can contribute to feelings of anxiety, depression, and in extreme cases, even suicide [20]. Zhao and Zhou argue that although the media's role in quickly disseminating critical information during collective trauma events is crucial, numerous studies have indicated that extensive exposure to disaster-related media could lead to adverse mental health consequences [21]. For example, consider the case of early television exposure related to the events of 9/11 and the Iraq War, which was found to be linked to subsequent increases in posttraumatic stress (PTS) symptoms [22]. Similarly, after the Boston Marathon bombings, individuals residing outside the directly affected community who engaged in six or more hours of daily media exposure related to the bombings experienced elevated acute stress symptoms [23]. These cases show that a similar situation occurring in China's public health issues, such as the COVID-19 pandemic, could potentially lead to psychological harm to the public. Therefore, while the rapid dissemination speed of new media undoubtedly brings advantages in spreading public health information and raising awareness, it also carries certain risks that could harm the general public.

#### 4.2 Audience acceptance

The influence of media extends to diverse groups, facilitating its acceptance of the audience. Media platforms offer dynamic and interactive formats that connect all people at once through the Internet, and they will not be affected by the wealth gap or age gap, especially when compared with traditional media. In fact, there were around 1.03 billion social media users in China by 2022, equivalent to around 74 percent of the Chinese population from diverse groups [24]. This includes a wide range of population groups, such as different age cohorts, where both young and elderly individuals have become receptive to media. The young population accepts new media since they are growing up in the digital era, enabling them to engage with various forms of media that are convenient and engaging to them. Even the media has become the mainstream of education, which can directly affect the health awareness knowledge of young people [25]. However, young individuals'

extensive utilisation of social media does not inherently correlate with elevated news and media literacy levels [25]. Specifically, those from economically disadvantaged backgrounds are prone to possessing deficient media literacy skills, including the ability to discern political bias or identify sponsored content that might be misleading [25]. Similar circumstances also occur within the elderly population, who are equally attracted by the inclusiveness and convenience of new media but are also easily misled by false information within the media. In China, this phenomenon is often seen among the elderly, especially in media apps such as WeChat. The elderly can easily be misled by wrong information about health that seems to threaten their lives, which results in them spreading to more people and fueling the rumour, most of whom are family members of the elderly group. Hence, individuals from economically disadvantaged backgrounds, lower educational attainment, and the elderly population are particularly easy to be misled by the media.

However, beyond that, it has a wide range of benefits for the general public, especially for patients. The interactive nature of new media allows for immediate engagement, enabling users to seek clarifications and participate in discussions, thereby fostering a more informed and inclusive public discourse on health matters. Kanchan and Gaidhane argue that 80% of internet users use social media to research doctors, hospitals, and medical news and information [2]. Patients are also willing to share their health experiences on these platforms, offering suggestions to others. This active involvement results in patients comprehending health information better and actively participating in self-care, significantly altering the patient-provider dynamic [2]. Social media benefits patients in various domains, including finding healthcare experts, accessing peer support, exchanging personal anecdotes, and promoting healthy behaviours [2]. The interactive, accessible, and personalised nature of new media aligns with the public's evolving communication preferences and contributes significantly to the heightened acceptance of media as valuable tools for enhancing public health science understanding.

#### 5. Media and surveillance

At last, media assumes a pivotal role in shaping the public sphere, emphasising monitoring the general population. Media not only informs and educates but also wields power to shape public perceptions, attitudes, and behaviours. This influence is particularly pronounced in monitoring, where the media's role extends beyond providing news and content to actively observing and surveilling societal activities. Nevertheless, the media's influence in monitoring the general public can be multifaceted.

The ubiquity of digital technologies and social media platforms has enabled individuals to share their lives, opinions, and activities with unprecedented ease. This continuous sharing creates a trail of digital footprints that can be tracked, analysed, and interpreted by various

entities, including governments, organisations, and citizens. This gives the media the chance to use the population's collective wisdom for public health surveillance. For current monitoring attempts, in a 2018 research project, Yasmin and her colleagues analysed geolocated tweets to monitor public health during a large event in Canada. They compared Twitter data to other sources for heat alerts during the 2015 Pan/Parapan American Games. According to their findings, using syndromic data sources in pre-diagnostic public health surveillance for large gatherings has been beneficial. [26]. Additionally, the media platform offers a convenient location for disease surveillance, enhancing its capacity to find disease outbreaks. Kanchan and Gaidhane discuss media and techniques referred to as user-generated data and real-time surveillance of public health indicators, like flu, foodborne illnesses, or heat alerts, which can detect infectious disease cases more quickly [2]. This rapid identification, especially through alerts, allows for prompt investigations or interventions. In 2018, Wakamiya, Kawai and Aramaki researched using Twitter to identify Influenza outbreaks by analysing geotagged tweets and data from fixed sensors [27]. Media surveillance contributes to a sense of constant observation, influencing individuals to modify their behaviour to align with perceived expectations.

However, the media's surveillance of the public relies on unseen authority, raising ethical concerns and affecting individuals' privacy. Perhaps the most famous example of the historical significance of technology in surveillance is Bentham's Panopticon, a structure whose geometry allowed a jail guard to watch the inmates without them knowing [28]. Foucault (1983) argues that the essence of power lies in the asymmetry of observation without reciprocation and the control that stems from differential knowledge possession [29]. Emphasising the significance of this asymmetry, Foucault further explains that the Panopticon's main impact is to create a continuous state of conscious visibility in the inmate, ensuring the automatic operation of power [30]. He also highlights that surveillance should yield lasting effects, even if its actions are intermittent [30]. This implies that it is not solely the act of being observed that prompts compliance with authority but the potential for observation [28].

A representative example of this would be China's contact-tracing app 'Health Code' (jian kang ma), used during the COVID-19 pandemic, which was embedded in popular media platforms WeChat and Alipay and tracks the location of individuals and identifies those at risk by cross-referencing retrospective travel data [31]. The health code undoubtedly emerges as a product of authoritative control over media, capable of delivering more efficient and precise pandemic updates. However, this is predicated on the automatic acquisition of private information from the public. Due to the compelling nature of unseen authority, individuals are left with no choice but to accept this state of media surveillance. The Health Code app contributes to regulating individuals' mobility through colour-coded designations: green, yellow, or red. A green code signifies health and grants unrestricted travel. Conversely, a yellow or red code represents a medium or high COVID-19 exposure risk, leading to

restricted entry to public spaces and potential testing or self-quarantine obligations [31]. Hence, while the public is protected through media surveillance, they lose their privacy and even experience curtailed personal freedom. It is evident that in the era of extensive media surveillance, it is undoubtedly a double-edged sword --- while it can offer certain benefits to the public, it also leads to the loss of many individual rights.

## 6. Conclusion

Media can effectively enhance public health awareness of science through its wide distribution channels, rapid dissemination speed, broad audience reach, and systematic public surveillance. However, due to these attributes, its drawbacks cannot be disregarded. These include accelerating the spread of misinformation and rumours, causing panic and psychological distress among the public, and harming individuals' privacy and personal rights. However, in China's contemporary era, the media's impact on public health science awareness can be likened to a double-edged sword, yet the benefits undoubtedly outweigh the drawbacks. Fewer individuals would be informed without the media's dissemination of health science awareness, and government and relevant authorities would struggle to respond promptly to emergencies. As seen in the case of the recent COVID-19 outbreak, China's media played a crucial role in elevating public awareness and effectively managing the situation, preventing worsening trajectories.

However, this article does possess certain limitations, given its reliance on existing literature reviews. It is suggested that future research could benefit from employing primary data collection methods, such as conducting interviews with relevant individuals and creating survey questionnaires, to obtain more effectively representative data reflecting the current social status.

In fact, with the exponential increase in the speed of mass communication and information exchange, the proliferation of rumours and misinformation has surged. While media surveillance has shaken the public's trust in media. This dynamic gives rise to new societal issues that warrant future investigation, such as the need for the public to enhance their comprehensive ability to discern the authenticity of information and not fall victim to pseudoscientific beliefs. The public generally trusted the media in the past, but scepticism has become more prevalent nowadays, prompting concerns about societal governance and cohesion. It is worth exploring whether this shift will lead to increased pressures on public management and social cohesion.

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